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10/573,213

01/16/2007

Heinz Bauer

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Ballard Spahr LLP

SUITE 1000

999 PEACHTREE STREET

ATLANTA, GA 30309-3915

EXAMINER

PETTITT, JOHN F

ART UNIT

PAPER NUMBER

3744

MAIL DATE

DELIVERY MODE

03/16/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/573,213 | Applicant(s) BAUER ET AL. | |
| | Examiner John F. Pettitt | Art Unit 3744 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 8-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 22 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>1/16/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election, with traverse, of group I, claims 1-9 and of species II, claim 7, in the reply filed on 12/23/2009 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse, relative to arguments (MPEP § 818.03(a)).

Claim Objections

Claims 1-7 are objected to because of the following informalities:

In regard to claim 1, the recitation of "the subcooling" (line 5) lacks antecedent basis and should read --subcooling--.

In regard to claim 2, the recitation, "than the evaporation pressure of the remaining part flow" (line 3) lacks antecedent basis and should read --than **an** evaporation pressure of **a** remaining part flow--.

In regard to claim 5, the recitation, the volumes and/or evaporation pressures of the two part flows" lacks antecedent basis and should read --volumes and/or evaporation pressures of two part flows--.

In regard to the dependent claims, they should be introduced as --The method-- to avoid ambiguity. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In regard to claim 1, the recitation, "the actual liquefaction" (line 4) is indefinite as the recitation lacks antecedent basis and because there is no distinction that is provided as to what is considered actual; therefore, such is assumed to read --the liquefaction-- as well as all other references to the liquefaction. In regard to claims 3-4, the recitations, "the separation" (line 1) lack antecedent basis and there is no distinction between the liquefaction that is performed by the second circuit refrigerant and the liquefaction performed to separate some components of the hydrocarbon flow, and therefore there is no ascertaining which components would or would not be included by the recitation. Further the recitation, "the separation unit" (line 2, claim 4) and "the provision of cooling in the separation unit" lack antecedent basis. Neither is there any antecedent basis for "the two part flows". In regard to claim 7, the recitation, "the load" lacks antecedent basis and there is no basis to determine what the load might be.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Stockmann (US 6253574). In regard to claims 1, 5-6, 7, Stockmann teaches a method for the

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liquefaction of a hydrocarbon-rich flow (column 1, line 5), whereby the liquefaction of the hydrocarbon-rich flow is effected against a refrigerant circuit cascade consisting of three refrigeration circuits (column 2, lines 35-40; PRC, LRC, SRC), whereby the first (PRC) of the three refrigeration circuits serves to provide preliminary cooling (in E-1; column 2, lines 45-46), the second refrigeration circuit (LRC) serves to provide liquefaction (column 3, line 45), and the third refrigeration circuit (SRC) serves to provide sub-cooling (column 4, lines 20-22, 35) of the liquefied hydrocarbon-rich flow, and whereby each refrigeration circuit comprises at least one single-stage or multi-stage compressor (P3, L3, S3), characterized in that at least one part flow (L5) of the refrigerant of the second refrigeration circuit (LRC) is used (participates in heat exchanger E-1) for the preliminary cooling of the hydrocarbon-rich flow (1). In regard to claim 2, Stockmann teaches the part flow (L-5) of the refrigerant of the second refrigeration circuit (LRC) used for the pre-cooling of the hydrocarbon-rich flow (1) is evaporated at a pressure (column 7, lines 30-31) which is higher than an evaporation pressure of a remaining part flow (to L9) of the refrigerant of the second cooling circuit (LRC), and is conducted to the compressor (L3) of the second cooling circuit (LRC) at an intermediate pressure level (column 7, line 35). In regard to claim 3, Stockmann teaches separation of unwanted components (column 5, lines 45-50) before the liquefaction of the hydrocarbon-rich flow by the second refrigerant circuit (LRC). In regard to claim 4, at least part of the part flow (L5) is used as a part of the process for providing the cooling in heat exchanger (E-1). In regard to claim 7, each compressor share the same energy input source (as all compressors are driven by a single drive G, column 5, line 30).

Claims 1, 3-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Dubar (US 5768912). In regard to claims 1, 5-6, Dubar teaches a method for the liquefaction of a hydrocarbon-rich flow (1), whereby the liquefaction of the hydrocarbon-rich flow is effected against a refrigerant circuit cascade consisting of three refrigeration circuits (see the designation of each below), whereby the first (114) of the three refrigeration circuits serves to provide preliminary cooling (within 100; column 6, line 18; column 10, line 33), the second refrigeration circuit (10,11,12,22,23,24,19,20,21,37) serves to provide liquefaction (via 101, 102, and/or 103; column 12, lines 1-5), and the third refrigeration circuit (10, 14, 15, 16, 17 ,18) serves to provide sub-cooling (via 104; column 11, line 59) of the liquefied hydrocarbon-rich flow, and whereby each refrigeration circuit comprises at least one single-stage or multi-stage compressor (in 114, (111, 112), and 113), characterized in that at least one part flow (part of 21) of the refrigerant of the second refrigeration circuit (10,11,12,22,23,24,19,20,21,37) is used (participates in heat exchanger 100) for the preliminary cooling of the hydrocarbon-rich flow (1). In regard to claim 3, Dubar teaches separation of unwanted components (in A; column 8, lines 60-65) before the liquefaction of the hydrocarbon-rich flow by the second refrigerant circuit (10,11,12,22,23,24,19,20,21,37). In regard to claim 4, at least part of the part flow (part of 21) is used as a part of the process for providing the cooling in heat exchanger (100; column 11, line 36). In regard to claim 7, each compressor () share the same energy input (column 12, lines 20-30).

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Claims 1, 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Dubar (US 4539028). In regard to claims 1, 5-6, Paradowski teaches a method for the liquefaction of a hydrocarbon-rich flow (1), whereby the liquefaction of the hydrocarbon-rich flow is effected against a refrigerant circuit cascade consisting of three refrigeration circuits (see the designation of each below), whereby the first (51, 65, 68, 74, 71, 77, 62) of the three refrigeration circuits serves to provide preliminary cooling (within 6; column 8, lines 36-38), the second refrigeration circuit (49, 66, 69, 78, 72, 75, 63) serves to provide liquefaction (column 8, line 48), and the third refrigeration circuit (18, 19, 22, 23, 4) serves to provide sub-cooling (within 4; column 8, lines 36-38) of the liquefied hydrocarbon-rich flow, and whereby each refrigeration circuit comprises at least one single-stage or multi-stage compressor (50, 49, 48, 18, 19, 22, 23), characterized in that at least one part flow (part of 69) of the refrigerant of the second refrigeration circuit (49, 66, 69, 78, 72, 75, 63) is used (participates in heat exchanger 6) for the preliminary cooling of the hydrocarbon-rich flow (1). In regard to claim 7, each compressor (50, 49, 48, 18, 19, 22, 23) share the same energy input (column 7, lines 35-40).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John F. Pettitt whose telephone number is 571-272-0771. The examiner can normally be reached on M-F 8a-4p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler or Frantz Jules can be reached on 571-272-4834 or 571-272-

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6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John F Pettitt /
Examiner, Art Unit 3744

/Cheryl J. Tyler/
Supervisory Patent Examiner, Art
Unit 3744

JFP III
March 10, 2010